

INSTITUTE ACTIVITIES

a. REFEREED PAPERS

- Boston, P.J.**, Frederick, R.D., Welch, S.M., Werker, J., Meyer, T.R., Sprungman, B., Hildreth-Werker, V., Thompson, S.L., & Murphy, D.L., 2003, Human utilization of subsurface extraterrestrial environments: *Gravity & Space Biology Bulletin*, v. 16, n. 2, p. 121-131.
- Boston, P.J.** 2004. Lava tube structures on Earth and Mars: Formation and geomicrobiology: *Planetary Space Sciences Journal* [in press].
- Boston, P.J.**, 2004, Caves on Mars: *Icarus* [in press].
- Northup, D.E., Barns, S.M., Yu, L.E., Spilde, M.N., Schelble, R.T., Dano, K.E., Crossey, L.J., Connolly, C.A., **Boston, P.J.**, Natvig, D.O., & Dahm, C.N., 2003, Diverse microbial communities inhabiting ferromanganese deposits in Lechuguilla and Spider Caves: *Environmental Microbiology*, v. 5, n. 11, p. 1071-1086.

b. ARTICLES IN EDITED GUIDEBOOKS AND PROCEEDINGS

- Boston, P.J.**, Frederick, R.D., Welch, S.M., Werker, J., Meyer, T.R., Sprungman, B., Hildreth-Werker, V., & Thompson, S.L. 2004. Extraterrestrial caves as science targets for future missions: *Space Technology and Applications Forum 2003 Proceedings*, AIP #654. American Institute of Physics, College Park, MD.
- Dubowsky, S., Iagnemma, K., **Boston, P.J.**, et al., 2003, Microsphere explorers for intelligence gathering in debris, caves, and other subterranean environments: DARPA White Paper BAA03-01.
- Hose, L.D.**, 2003, Eastern Sierra field trip guide, in Proffitt, M. (ed.), Range of light, realms of darkness: *A guidebook for the 2003 NSS Convention*: National Speleological Society, Huntsville, Alabama, p. 83-95.
- Land, L.**, 2003, Regional geology of the Pecos Country, in Johnson, P.S., **Land, L.**, Price, L.G., & Titus, F. (eds.), *Water resources of the lower Pecos Region, New Mexico: Science, policy, and a look to the future*: New Mexico Bureau of Geology and Mineral Resources, 2003 New Mexico Decision Makers Guidebook, p. 9-13.

c. CONTRIBUTIONS TO EDITED BOOKS

- Boston, P.J.**, 2004, Biofilms: in Gunn, J., *Encyclopedia of Cave and Karst Science*, Fitzroy Dearborn Publishing, London, p. 145-147.
- Boston, P.J.**, 2004, Extraterrestrial caves: in Gunn, J., *Encyclopedia of Cave and Karst Science*, Fitzroy Dearborn Publishing, London, p. 355-358.
- Boston, P.J.**, Lavoie, K., & Northup, D. 2004. Preserving the unseen as you clean, in Hildreth-Werker, V., (ed.), *Cave Conservation and Restoration*, NSS, Huntsville, Alabama [in press].
- Hose, L.D.**, 2004, Cueva de Villa Luz, Mexico, in Gunn, J., *Encyclopedia of Cave and Karst Science*, Fitzroy Dearborn Publishing, London, pl 758-759.
- Hose, L.D.**, 2004, Golondrinas and the giant shafts, Mexico, in Gunn, J., *Encyclopedia of Cave and Karst Science*, Fitzroy Dearborn Publishing, London, p. 392-393.
- Hose, L.D.**, 2004, Huautla cave system, Mexico, in Gunn, J., *Encyclopedia of Cave and Karst Science*, Fitzroy Dearborn Publishing, London, p. 427-428.
- Hose, L.D.**, 2004, Selma Plateau caves, Oman, in Gunn, J., *Encyclopedia of Cave and Karst Science*, Fitzroy Dearborn Publishing, London,

p. 639-641.

Jones, W.K., Hobbs, H.H., Jr., Wicks, C.M., Currie, R.R., **Hose, L.D.**, Kerbo, R.C., Goodbar, J.R., & Trout, J., 2003, *Recommendations and guidelines for managing caves on protected lands*: Karst Waters

Institute Special Publication 8, Charles Town, WV, 95 p.

Land, L., 2004, Evaporite karst and regional ground water circulation in the lower Pecos Valley, in Johnson, K.S. & Neal, J.T. (eds.), *Evaporite Karst and Engineering and Environmental Problems in the United States*: Oklahoma Geological Survey Circular 109 [in press].

d. PUBLICATIONS EDITED

- Boston, P.J.**, 2003, *Astrobiology Journal* (refereed journal). Senior Editor, v. 3.
- Hose, L.D.**, 2003, *Journal of Cave and Karst Studies* (refereed journal). Chief Editor, v. 65, n. 1-3.
- Johnson, P.S., **Land, L.**, Price, L.G., & Titus, F. (eds.), *Water Resources of the Lower Pecos Region, New Mexico: Science, Policy, and a Look to the Future*: New Mexico Bureau of Geology and Mineral Resources, 2003 New Mexico Decision Makers Guidebook, 148 p.
- Miller, J.E.**, **S.H. Schneider**, Crist, E., & **Boston, P.J.**, (eds.), 2004, *Scientists on Gaia: New winds blowing*, MIT Press.

e. ABSTRACTS

- Hose, L.D.**, 2003, Cave and karst studies at the beginning of the 21st Century: The New Mexico connection: *New Mexico Geological Society Proceedings Volume*, 2003 Annual Spring Meeting, Socorro, New Mexico, p. 24.
- Hose, L.D.**, **Bailey, Z.C.**, **Boston, P.J.**, & **Land, L.**, 2003, America's National Cave and Karst Research Institute 2003: The gearing up phase [abst.]: *Journal of Cave and Karst Studies*, v. 65, n. 3, p. 185.
- Hose, L.D.**, **Bailey, Z.C.**, **Land, L.**, & **Boston, P.J.**, 2003, America's National Cave and Karst Research Institute 2003: The gearing up phase [abst.]: *Geo*, v. 30, n. 2 & 3, p. 38.
- Hose, L.D.**, **Bailey, Z.C.**, **Land, L.**, & **Boston, P.J.**, 2003, America's National Cave and Karst Research Institute 2003: The gearing up phase: *New Mexico Geological Society Proceedings Volume*, 2003 Annual Spring Meeting, Socorro, New Mexico, p. 25.
- Hose, L.D.**, & **Boston, P.J.**, 2003, Cave and karst studies at the beginning of the 21st Century: Role of the National Cave and Karst Research Institute: *GSA Abstracts with Programs*, v. 35, no. 7, p. 452.
- Hose, L.D.**, & **Boston, P.J.**, 2003, The National Cave and Karst Research Institute: Defining its role in cave and karst management [abst.]: *Journal of Cave and Karst Studies*, v. 65, n. 3, p. 175.
- Hose, L.D.**, & **Boston, P.J.**, 2003, The National Cave and Karst

Research Institute: How will it address its science mandate? [abst.]: *Journal of Cave and Karst Studies*, v. 65, n. 3, p. 186.

Land, L., 2003, Role of evaporite karst in hydrology and morphologic evolution of the lower Pecos Valley, New Mexico, USA: *GSA Abstracts with Programs*, v. 35, no. 6, p. 316.

Land, L., 2003, *Role of evaporite karst in regional ground water circulation in the lower Pecos Valley*: *New Mexico Geological Society Proceedings Volume*, 2003 Annual Spring Meeting, Socorro, New Mexico, p. 36.

f. EDITORIALS

Boston, P.J., 2003, The National Cave and Karst Research Institute: American speleology's remarkable opportunity: *Journal of Cave and Karst Studies*, v. 65, n. 1, p. 87.

g. GRANT PROPOSAL, REFEREED JOURNAL, AND OTHER REVIEW PANELS

- *Astrobiology Journal* (Boston-9)
- DARPA (Boston-2)
- *Geomicrobiology Journal* (Boston-1)
- *Gravity and Space Biology Journal* (Boston-2)
- *Journal of Hydrology* (Hose-1)
- *New Mexico Geology* (Land-2)
- *Water Resources of the Lower Pecos Region* (Land)
- National Aeronautic and Space Administration (Boston-2 proposals)
- National Geographic Society grant programs (Hose-1; Boston-2)
- National Institutes for Water Resources/U.S. Geological Survey National Competitive Grant Program (Hose-1)
- National Research Council/DOE Committee on Novel Approaches to the Management of Greenhouse Carbon: Advanced Subsurface Technologies Subgroup (Boston-panel, 2 proposals)
- National Science Foundation (Hose-1 panel + 2 proposals; Boston-2 proposals)

h. GRANT WRITING ACTIVITIES

- National Institute of Health's International Cooperative Biodiversity Groups grant proposal (Hose – Co-PI)
- National Science Foundation Science and Technology Center grant proposal (Boston - PI, Hose – Co-PI)

i. CONFERENCE AND FIELD TRIP LEADERSHIP

- International Conference on Karst Hydrogeology & Ecosystems Field Trip to Southeastern New Mexico (Land – 1-day leader, Scott provided assistance to 4-day trip)
- National Speleological Society National Convention's Eastern Sierra Geology Field Trip (Hose - Organizer and leader)
- New Mexico Bureau of Geology's 2003 Decision Makers Field Conference *Water Resources of the Lower Pecos Region, New Mexico* (Land - Leader).
- New Mexico Geological Society 2007 field conference featuring caves and karst in southeastern New Mexico - Successful proposal and planning (Boston, Land)
- New Mexico Geological Society spring conference in Socorro, New Mexico, including two successful, half-day Cave and Karst sessions (one poster, one oral) (Boston - Organizer)

j. PROFESSIONAL PRESENTATIONS

- Geological Society of America national meeting in Seattle, Washington - Poster presentations, *Role of evaporite karst in*

hydrology and morphologic evolution of the lower Pecos Valley, New Mexico (Land) and Cave and karst studies at the beginning of the 21st Century: Role of the National Cave and Karst Research Institute (Hose)

- Institute of Ecotecnics Annual Meeting, Synergia Ranch, Santa Fe, NM (Boston)
- International Conference on Karst Hydrogeology and Ecosystems at Western Kentucky University (WKU) in Bowling Green, Kentucky - Poster presented (Hose, Boston)
- Karst Waters Institute's *Interdisciplinary Workshop on Epikarst* in Shepherdstown, West Virginia - Poster presentation, *America's National Cave and Karst Research Institute 2003: The gearing up phase* (Hose).
- Mayfield Distinguished Lecturer, Bowling Green Univ., OH (Boston)
- Cuyahoga National Park, Distinguished Lecture Series (Boston)
- NPS Water Resources Division in Fort Collins and the NPS Geologic Resources Division in Lakewood, Colorado – Separate oral presentations, *Role of the National Cave and Karst Research Institute in the 21st Century* (Hose)
- National Speleological Society National Convention in Porterville, California - Three oral presentations (Hose, Boston), and two posters (Boston, Hose).
- National Cave and Karst Management Symposium in Gainesville, Florida - Oral presentation, *National Cave and Karst Research Institute 2003: Working through partnerships towards America's future* (Hose).
- New Mexico Geological Society spring conference in Socorro, New Mexico - One poster, *America's National Cave and Karst Research Institute: The gearing up phase* (Hose), one oral presentation, *Role of evaporite karst in regional ground water circulation in the Lower Pecos Valley* (Land), and the keynote address, *Cave and karst studies at the beginning of the 21st Century: The New Mexico connection* (Hose).
- New Mexico Institute of Mining and Technology - Oral presentation *Frontiers of Cave and Karst Science* (Land).
- New Mexico Tech Earth & Environmental Sciences Department Seminar (Boston)
- New Mexico Tech Chemistry Department Seminar (Boston)
- New Mexico Tech Biology Dept. talk (Boston)
- New Mexico State University colloquium talk, Las Cruces, NM (Boston)
- University of Texas-El Paso Geological Sciences Department Seminar – 2 presentations (Land and Boston).
- U.S. Geological Survey in Reston, Virginia – Oral presentation *National Cave and Karst Research Institute: Update 2003* (Hose)

K. COMMUNITY PRESENTATIONS/EDUCATION

- American Association of University Women, Doylestown, Pennsylvania (volunteers Kleina & Soroka)
- Boy Scouts Venturing Program, Allentown, Pennsylvania (volunteers Kleina and Soroka)
- Carlsbad Lions Club – *Role of the National Cave and Karst Research Institute in the 21st Century* (Hose)
- Carlsbad Kiwanis Club – *Role of the National Cave and Karst Research Institute in the 21st Century* (Hose)
- Carlsbad Potash Section of the Society of Mining Engineers – *The National Cave and Karst Research Institute: What we are doing, where we are headed* (Hose).

- Carlsbad Rotary Club – *Role of the National Cave and Karst*

Research Institute in the 21st Century (Hose)

- Cuyahoga National Park, Ohio, distinguished lecturer (Boston)
- New Mexico Tech Earth Research Day, cave seminar for prospective students (Boston)
- New Mexico Tech Earth Science Olympiad cave research talk (Boston)
- Pecos Valley Grotto of the National Speleological Society (Land).
- Sally Ride Club for Middle School Girls, live webcast (Boston)
- Sigma Xi Annual Dinner, banquet speech (Boston)

I. MAJOR MEDIA PROJECTS AND PUBLICITY

- British Broadcasting Corporation (Hose)
- *Current-Argus* newspaper, Carlsbad, NM (Hose, Scott)
- GSA Connection (<http://www.geosociety.org/MbrNews/0311/prNCKRI.htm>).
- *Geotimes* magazine (Hose)
- KCCC hour-long interview in Carlsbad, New Mexico (Hose)
- KTEP interview, the local public radio station in El Paso, Texas (Land)
- NHK (Japanese Broadcasting Corporation) Television (Hose, Boston, numerous volunteers).
- *Nature* magazine (Hose)
- *Space.com* magazine (Boston)
http://www.space.com/scienceastronomy/mars_caves_030905.html)
- Super Science, a science magazine for middle school age children (Hose)

M. CAVE RESEARCH, ASSESSMENT, AND ADVISORY EFFORTS

Projects were continued or begun in a number of cave study sites this year. In some cases, expert advice was sought from NCKRI personnel on the research potential of various caves. The following list gives a brief synopsis.

- Carlsbad Caverns science instrument planning (Boston)
- Cueva de las Barrancas, NM, Trip to assess previous geomicrobial inoculations (Boston)
- Cueva de Villa Luz, Tabasco, Mexico, with NHK Japan film crew (Hose, Boston, volunteers)
- Endless Cave and Spider Cave sampling and assessment trips (Boston)
- Ft. Stanton Cave, NM - Snowy River science assessment trips and advising with emphasis on paleohydrology, geomicrobiology, and age dating (Boston, Land, Hose)
- La Tetera Cave, Arizona science assessment trip, Tucson, AZ

- (Boston)
- MIT Field and Space Robotics team taken to see lava tubes in El Malpais National Monument, NM (Boston)
- Study of evaporite karst phenomena and relationship to regional groundwater circulation in the lower Pecos Valley (Land)
- Study of groundwater circulation within the San Andres Artesian Aquifer, principal fresh water source for Roswell Artesian Basin, NM (Land)
- Assessment of groundwater discharge from Bottomless Lakes

cenotes, and possible geologic hazard from gypsum karst subsidence (Land)

- Systematic water level baseline measurements in irrigation wells throughout the Roswell Artesian Basin to assess response of Artesian Aquifer to drought (Land)

N. PROFESSIONAL MEETINGS ATTENDED

- Cooperative Ecosystem Studies Units Network meeting, Washington, D.C. (Hose)
- Geological Society of America, Seattle, Washington (Hose, Land)
- George Wright Society conference, San Diego, California (Hose)
- Hydrogeology Consortium Florida Karst Workshop, Florida (Ron Kerbo represented NCKRI)
- International Conference on Karst Hydrogeology & Ecosystems, Bowling Green, KY (Hose, Boston)
- Mars Society Conference, Eugene, Oregon (Boston)
- NIAC Principal Investigators meeting Atlanta, Georgia (Boston)
- NASA NSCORT meeting, banquet speech, Purdue University, Indiana (Boston)
- National Cave and Karst Management Symposium, Gainesville, Florida (Hose)
- National Speleological Society Annual Convention, Porterville, CA (Boston, Hose)
- New Mexico Geological Society spring conference in Socorro